

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-15 (Canceled).

Claim 16 (New): A method for the production of a high-strength material, comprising the steps of:

producing a block of aluminum-based base alloy, the base alloy including

a content of 5.5 to 13.0 mass - % silicon,

a content of magnesium according to the formula

$$\text{Mg [mass - \%]} = 1.73 \times \text{Si [mass - \%]} + m,$$

where $m = 1.5$ to 6.0 mass - % magnesium, and

a content of copper between 1.0 and 4.0 mass - %;

hot-forming the base alloy block into a hot-formed element in at least one hot-forming step subsequent to the producing step; and

subjecting the hot-formed element to a heat treatment in a heat treatment step after the hot-forming step, the

heat-treatment consisting of a solution heat treatment, a quenching, and an artificial aging.

Claim 17 (New): The method according to claim 16, wherein the producing step comprises spray compacting.

Claim 18 (New): The method according to claim 16, wherein the base producing step comprises continuous casting.

Claim 19 (New): The method according to claim 16, wherein producing step comprises chill casting.

Claim 20 (New): The method according to claim 16, wherein the base alloy contains 0.5 to 1.5 wt.-% magnesium phosphate for the purpose of increasing grain fineness of primary magnesium silicide in the base alloy.

Claim 21 (New): The method according to claim 16, wherein the hot-forming step is selected from the group consisting of extrusion, hot rolling, and forging.

Claim 22 (New): The method according to claim 18, wherein the hot forming step comprises a degree of deformation exceeding five.

Claim 23 (New): The method according to claim 16, wherein the content of copper in the base alloy ranges between 1.5 and 3.0 mass - %.

Claim 24 (New): The method according to claim 16, wherein the aluminum contains less than 1 mass - % foreign elements.

Claim 25 (New): Method according to claim 16, wherein the heat treatment step consists of solutionizing the hot-formed element at 500°C for 2 h, quenching in water, and subsequently annealing at 210°C for 10 h.

Claim 26 (New): A material on the basis of an aluminum alloy, obtained by the method according to claim 16.

Claim 27 (New): The material according to claim 26, wherein the material is shaped as a internal combustion engine component such as a piston.

Claim 28 (New): A method for the production of a high-strength material, comprising the steps of:

spray compacting a block of aluminum-based alloy, the alloy including

a content of about 8.1 mass - % silicon,

a content of magnesium according to the formula

$$\text{Mg [mass - \%]} = 1.73 \times \text{Si [mass - \%]} + m,$$

where $m = 1.5$ to 6.0 mass - % magnesium, and

a content of copper between 1.0 and 4.0 mass - %;

hot-forming the alloy block subsequent to the spray compacting step into a hot-formed element; and

subjecting the hot-formed element to a heat treatment after the hot-forming step, the heat-treatment step consisting of a solution heat treatment, a subsequent quenching, and a final artificial aging.

Claim 29 (New): A method for the production of a high-strength material, comprising the steps of:

producing a block of aluminum-based alloy, the alloy including

a content of 5.5 to 13.0 mass - % silicon,

a content of magnesium according to the formula

$$\text{Mg [mass - \%]} = 1.73 \times \text{Si [mass - \%]} + m,$$

where m = 1.5 to 3.2 mass - % magnesium,
a content of copper between 1.0 and 4.0 mass - %, and
a content of magnesium phosphate between 0.5 and 1.5 wt.-%;

hot-forming the alloy block subsequent to the spray compacting step at least once to obtain a hot-formed element; and
subjecting the hot-formed element to a heat treatment after the hot-forming step, the heat-treatment step consisting of a solution heat treatment, a quenching, and an artificial aging.

Claim 30 (New): The method according to claim 29, wherein traces of beryllium are added to the alloy.

Claim 31 (New): An aluminum-based alloy, wherein the alloy is selected from the group of alloys L1 to L3, in wt.-% consisting of

	Si	Mg	Cu	Fe	Magnesium Phosphate
L1	8.1	17.2	1.7	0.3	
L2	6.0	12.5	2.1	0.2	1.0
L3	12.9	25.1	1.9	0.15	0.9

with the remainder of the alloy consisting of aluminum apart from inevitable impurities and 50 parts per million beryllium.

Claim 32 (New): The alloy according to claim 31, wherein the alloy is shaped as an internal combustion engine component.

Claim 33 (New): The alloy according to claim 31, wherein the alloy is obtained in an alloy composition step selected from the group consisting of spray compacting and casting, wherein the composed alloy is subsequently subjected to at least one hot-forming step to achieve a hot-formed element presenting a degree of deformation exceeding five, and wherein the hot-formed element is subjected to a heat treatment after the hot-forming step, the heat-treatment step consisting of a solution heat treatment, a quenching, and an artificial aging.